

DISCOVERY

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Thompson Center for
Autism & Neurodevelopment
University of Missouri

Unveiling the Journey of Discovery: Clinical Trials at the Thompson Center

At the Thompson Center, our dedicated research team is paving the way in understanding and addressing the complexities of autism. Among the many studies the team has been involved in over the last few years are several clinical trials. Samantha Hunter, the Thompson Center's Clinical Trials Manager, simplifies the complexity of clinical trials: "A clinical trial is a study where researchers test the safety and effectiveness of interventions such as medications or devices on human health outcomes." The essence of these studies lies in their potential to

unveil new pathways in healthcare. "The different medications we use today in modern medicine were made possible through volunteers completing clinical trials," said Hunter. Dr. Benjamin Black, Director of Medical Services and researcher at the Thompson Center, says that these volunteers, or research participants, are one of the hallmarks of working on clinical trials. "In clinical research, we think of our patients and families as partners with us, and we're all investigating together to see if something really works."

What's Inside?

- **Clinical Trials at the Thompson Center**
- **New EarliTec Study: Now Recruiting**
- **Propranolol Study Results Published**
- **Trainee Spotlight: Nanan Nuraini**
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Recent Clinical Trials at the Thompson Center

Yamo

Collaborators from the pharmaceutical company and academia initiated this multi-site study of a new medication's effects on core characteristics of autism, specifically interpersonal relationships, play and leisure, and coping skills. *PI: Dr. David Beversdorf & Dr. Tom Megerian, Chief Medical Officer and Executive Vice President of Clinical Development for Yamo Pharmaceuticals*

MapLight

Industry-sponsored, multi-site study investigating the effects of ML-004 on core characteristics of autism, focusing particularly on challenging outcomes like agitation and aggression. *PI: Dr. Benjamin Black, Co-I: Dr. David Beversdorf*

tVNS

Pilot study determining if transcutaneous vagal nerve stimulation (tVNS), which involves a small device that gives electric stimulation to an area behind the ear, should be further studied for therapeutic treatment of anxiety and sleep problems in children and teens with autism. *PI: Dr. Benjamin Black, Co-I: Dr. David Beversdorf*

Propranolol

Thompson Center study examining the effects of the beta-blocker on anxiety in people with autism. *PI: Dr. David Beversdorf*

COMBO

Thompson Center feasibility study looking at changes in anxiety when autistic individuals combine propranolol with ABA therapy. *PI: Dr. David Beversdorf*

A Glimpse Into Recent Trials

Recent studies at the Thompson Center have focused on pivotal outcomes linked to social communication and anxiety, two significant domains impacting many autistic individuals. These trials aim to tackle challenges such as agitation, aggression, and the often medication-resistant nature of anxiety among this population. Dr. David Beversdorf, a Thompson Center researcher, welcomes this new approach. "Many studies look at conditions that exist alongside autism," said Dr. Beversdorf, referring to past research projects that studied outcomes like sleep and gut health, "but these are some of the first we've done that focus on the core characteristics of autism."

The table above summarizes five of the Thompson Center's recent clinical research studies. These trials vary widely in their scopes and methodologies. For instance, the propranolol study engaged nearly 70 participants over a span of three years, while small COMBO and tVNS pilot studies focused on whether larger studies on these therapeutic agents should be conducted in the future. The industry-sponsored Yamo and MapLight trials have 10 or fewer participants enrolled through the Thompson Center, but are part of larger multi-site studies; the other projects are housed within the Thompson Center, thus giving our

researchers more opportunities for input into the design of the study.

Challenges in Clinical Research

One challenge of recruiting participants for these studies is balancing eligibility criteria with existing treatments. For example, in the cases of the Thompson Center's clinical trials where anxiety is a primary outcome being investigated, participants are ineligible if they are already taking antidepressants or SSRI medications. Families and individuals may also have reservations about trying new medications or therapies, which adds layers of intricacy to the recruitment process. New medications, like the one tested in the Yamo study, may be the first thing to come to mind for clinical trials. However, clinical trials are also used to investigate new uses of already established drugs. The medication tested in the MapLight study is a reformulation of a drug that is often prescribed for migraines. Propranolol is an inexpensive drug already used for test anxiety, migraines, and even for hemangiomas in infants. tVNS is not a medication at all and is believed to have less potential for side effects.

Clinical trials are also uniquely challenging because of the strict protocols they must follow. "Clinical trials are different from other types of studies as there is additional oversight

provided by the FDA,” Hunter explains. “They often take many years to complete as there are different stages to go through to thoroughly test the safety and efficacy of an intervention.” Dr. Richard (Rick) J. Barohn, Executive Vice Chancellor for Health Affairs and Hugh E. and Sarah. D. Stephenson Dean of the MU School of Medicine emphasizes that these procedures central to the integrity of the research. “Upholding the highest ethical standards, they prioritize participant safety while facilitating collaboration among experts, industry, and academia.” To help University of Missouri researchers rise to this challenge. Dr. Barohn started the Clinical Research Study Coordinator Bootcamp. This program gives researchers and their support staff the foundational knowledge needed to successfully run clinical trials.

Partnering with Patients

Despite the challenges that accompany clinical research, the Thompson Center team shares an enthusiasm for these studies. Participating in clinical trials often gives patients and families access to therapies they may not have been able to try otherwise. Hunter recalls the impact of working on the propranolol study, “several individuals benefitted from taking propranolol during the open label extension and it was amazing to see the medication work for them.” The MapLight study has a similar open label extension where individuals are guaranteed to receive the active study medication to determine if it is a good fit for them. Building relationships with patients and families stands out as a favorite aspect for many involved. “Our patients tend to be really invested in the research, from a personal standpoint of getting benefits of a particular therapy, but many of them are invested because of the potential contributions to the greater good,” Dr. Black said. “Even if it doesn’t help their family immediately, the idea of being part of something that benefits other people down the road is really special.”

What’s Next?

As ongoing trials eagerly await results, Thompson Center researchers look forward to the next steps in their clinical explorations. Dr. Black aims to expand the study of tVNS to new sites, including the University of Cincinnati and



Clinical Research Study Coordinator Bootcamp

The Clinical Research Study Coordinator Bootcamp is designed to equip research coordinators and clinical research staff with essential foundational knowledge. This engaging two-day program, hosted at the Roy Blunt NextGen Precision Health building, offers a blend of interactive lectures and group exercises facilitated by seasoned Mizzou study coordinators and research support leaders. Each session is structured as a lecture-style presentation, focusing on research topics from the coordinator’s viewpoint, complemented by interactive elements like gamified activities and collaborative breakout sessions guided by subject matter experts in respective fields. To ensure comprehension and participation, participants undergo pre- and post-tests, integrated quizzes, and engagement check-ins for each presentation.

Children’s Hospital of Orange County, pending approval of funding from the Department of Defense. Dr. Beversdorf’s hopes his research will address the broad range of autism characteristics by identifying subgroups within the autistic population. Perhaps identification of biomarkers unique to certain groups of people with autism will guide them to promising therapies that may not work for people on other areas of the spectrum. Meanwhile, the Thompson Center is still recruiting adults aged 18-45 with autism spectrum disorder for MapLight with the goal of eventually expanding the study to include teenage participants. As the journey continues, the Thompson Center’s researchers continue to display unwavering commitment to unraveling the complexities of autism to not only shape future interventions but foster a community of support for people with autism and their families.

Thompson Center Now Recruiting Typically-Developing and Autistic Children for EarliTec Study

The EarliTec Study is an exciting new project that began at the Thompson Center in October 2023. This study uses a tablet device to track the eye movements of children from the ages of 2 1/2 to 6 years to detect the presence of autism.

In the EarliTec Study, children with autism and typically developing children watch videos on a screen while a device tracks their eye movements in response to the stimuli. This eye-tracking device is called the EarliPoint Evaluation for Autism Spectrum Disorder. The data gathered from the eye movements is fed into an algorithm that shows the likelihood of autism versus no autism.

There is a significant amount of data for younger children already, and now the Thompson Center is developing a new algorithm for children up to their seventh birthday. In this first phase of the study, the data collected will be from children who are typically developing and children who have autism.

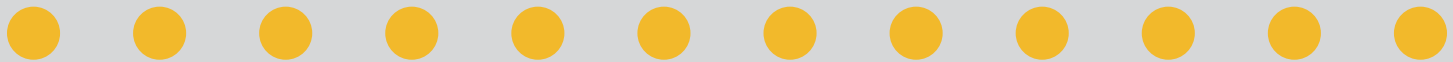
Dr. Kerri Nowell is the primary investigator for this study and discussed the benefits that this study will have for families. “We’re always



trying to figure out ways for us to do accurate, meaningful evaluations in a more efficient way and help get children with autism identified and connected to services as quickly as we can,” said Nowell. “This device could help speed up the autism evaluation process and give us more time to really work with families.”

The Thompson Center is actively recruiting for this study and is still in the beginning stages. The next phase of this study will be recruiting children across the board for the presentation of autism and this will include children who may have subtle presentations of autism.

If you are interested in learning more about participating in the EarliTec study, visit thompsoncenter.missouri.edu/studies.



MU Study Shows Blood Pressure Drug Can Reduce Anxiety for People with Autism

Findings reveal propranolol may help autistic kids and young adults who struggle with anxiety

A new study at the University of Missouri’s Thompson Center for Autism and Neurodevelopment found that propranolol, a medication that treats high blood pressure, can also help lower anxiety for kids and young adults with autism spectrum disorder (ASD).

Given that some individuals with ASD tend to struggle with anxiety at a far greater rate than their neurotypical peers, the new finding can significantly help such individuals with ASD.

David Beversdorf, a clinician at the Thompson Center, led the study, which involved 69 patients over a three-year span. Compared to a placebo group, the participants who received propranolol showed significantly reduced anxiety levels at their 12-week check-up appointments while receiving the medication. The study also examined if there were

significant changes in the individuals’ social communication skills, but no significant changes were found.

“The findings show that propranolol could serve as a helpful intervention for reducing anxiety for individuals with autism,” said Beversdorf, who also has appointments in the MU School of Medicine and the MU College of Arts and Science. “This drug has been around since the 1960s and is very inexpensive. Up until now, we haven’t had any known drugs that target psychiatric issues specifically for individuals with autism, so these results are very promising and can support future research.”

As a practicing clinician, Beversdorf has seen firsthand the positive benefits the medication can have in improving the overall quality of life for some patients with ASD and their families.

Trainee Spotlight: Nanan Nuraini

Nanan Nuraini joined the Thompson Center team in January 2021 as a Graduate Research Assistant. She was brought to the Thompson Center through working with her advisor, Dr. Beversdorf. Her research areas of interest are autism spectrum disorder and neuroimaging.

Tell us about your educational background.

I earned a Bachelor of Psychology from Padjadjaran University in Indonesia, a MSc in Psychology of Education from the University of Bristol in England, and am currently pursuing a Ph.D. in Neuroscience from the University of Missouri.

What brought you to the Thompson Center?

I started at the Thompson Center in January 2021 to work with my advisor, Dr. David Beversdorf.

How did you first get involved with autism research?

When I was younger, I volunteered in an autism clinic. They said I have excellent social skills, so I played with and accompanied children with ASD. I enjoyed my time with them. Then, my interest in autism grew, and I got accepted into a Ph.D. program in neuroscience involving people with autism.

What's your favorite thing about working in this field?

Getting to know and better understand people with autism and their families. I am grateful to be a part of their unique journey. I learned to be patient, accept people unconditionally, and never give up.

What vision do you have for your career?

One day, I want to become a world-class scientist in neuroscience. When my work in neuroscience is accepted by many scientists worldwide, I am confident that my goal to create a better world for autistic individuals will come true. In addition, I am originally from Indonesia, a developed country that does not have many researchers in the autism field. I hope to start a journey around Indonesia to help people with autism. Right now, there are many therapies available for people with autism, but they are costly. Hopefully, I can develop options that are affordable and accessible for them.

How do you think your time at the Thompson Center will influence the direction of your career?

Researching at the Thompson Center has been the best decision I have ever made. At the Thompson Center, I am surrounded by a very supportive community, and getting involved directly with the patients is helping me achieve my goal as a Ph.D. student in neuroscience. I believe one day, I can be involved in research training facilities, like the Thompson Center, as an expert in autism studies.



“As researchers we try our best to improve the lives of our patients, and it feels rewarding to help out,” said Beversdorf, who is a professor of radiology, neurology and psychological sciences as well as the William and Nancy Thompson Endowed Chair in Radiology. “I went into the field of neurology knowing I wanted to try to find new treatment options and interventions to benefit people with autism.”

“Randomized controlled trial of propranolol on social communication and anxiety in children and young adults with autism spectrum disorder,” was recently published in *Psychopharmacology*. Funding was provided by the United States Department of Defense Congressionally Directed Medical Research Program.

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2023 Student Research Poster Session Winners Announced

The 2023 Student Poster Session, held during the Thompson Center Autism Conference at the St. Charles Convention Center in September, saw record-breaking attendance for the second year in a row.

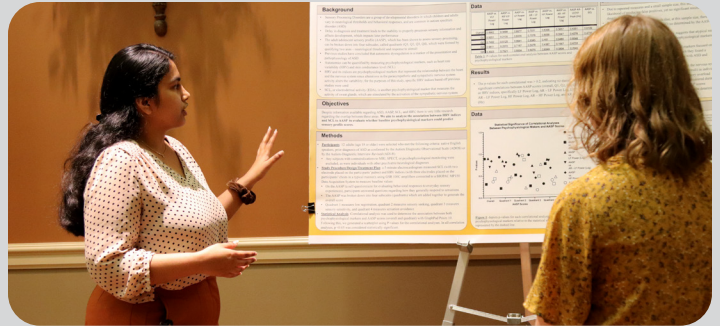
Twenty-four posters were on display representing the breadth of neurodevelopmental research across fields including psychology, special education, medicine, applied behavior analysis, neuroscience, informatics, occupational therapy, and social work.

Thank you to everyone who participated and congratulations to this year's winners:

1st Place Poster: Evaluation of the vrRSB: A Novel Toddler Metric for Quantitative Autistic Traits by Kristen Lineback, Washington University

2nd Place Poster: Online Learning for students with autism spectrum disorder (ASD) Parent Survey by Nargiza Buranova, University of Missouri

3rd Place Poster: Developing a Pipeline to Investigate Testosterone and Novel CSF Biomarkers of Autism by Rachel Pope, Washington University



Recent Publications

- Andres, E. M., Earnest, K. K., Xuan, H., Zhong, C., Rice, M. L., & Raza, M. H. (2023). Innovative Family-Based Genetically Informed Series of Analyses of Whole-Exome Data Supports Likely Inheritance for Grammar in Children with Specific Language Impairment. *Children* (Basel), 10(7). <https://doi.org/10.3390/children10071119>
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- Radoeva, P. D., Miley, V., Hunt, J. I., Legere, C., Deoni, S. C. L., Sheinkopf, S. J., Mazefsky, C. A., Philip, N. S., Dickstein, D. P. (2023). Systematic review: White matter microstructural organization in adolescents with depression. *JAACAP Open*. <https://doi.org/10.1016/j.jaacop.2023.08.006>
- Steigerwald, A. J., Ferguson, B. J., Nuraini, N., Barnett, J. C., Takahashi, N., Zamzow, R., Heilman, K. M., & Beversdorf, D. Q. (2023). Altered Allocation of Vertical Attention in Individuals With Autism Spectrum Disorder. *Cognitive and Behavioral Neurology* 36(3):p 159-165. <https://doi.org/10.1097/WNN.0000000000000342>



Want to see more from Thompson Center researchers?

Scan the code or visit <https://thompsoncenter.missouri.edu/publications/> for a full list of studies by Thompson Center authors and links to each publication.

Join A Study

MapLight

Participate in a clinical trial exploring the potential effects on social communication and other behaviors.

- Eligibility: Age 12-45 with a diagnosis of ASD AND participation of a parent/guardian
- Time required: Up to 10 visits and 1 phone call over approximately 25 weeks
- Location: Thompson Center
- Monetary compensation: \$50 per completed visit

Cry Perception Study

The goal of this research study is to learn about infant cries and their relationship with development. Participants will listen to and rate infant cry recordings based on how distressed the infant sounds and things like how you would respond to the cry. Understanding caregiver's ratings of infant cries has the potential to inform future developmental research. Learn more or sign up using this online screening form: <https://redcap.link/cryrating>.

- Eligibility: English-speaking caregiver age 18-60 with child(ren) age 5 years or younger
- Time required: Participants will complete a questionnaire and listen to and rate cry recordings during a 45-minute in-person study visit
- Location: Thompson Center
- Monetary compensation: Up to \$20

Early Years

The goal of this research study is to learn about how behaviors observed in newborns relate to meeting developmental milestones during the first years of life.

- Eligibility: Expectant parents age 18+
- Time required: Participants will submit newborn cry recordings and complete online surveys about baby's development through age 3
- Location: Online surveys, some families will be invited to the Thompson Center
- Monetary Compensation: Up to \$265

SPARK

SPARK is a free online study with a simple mission: to speed up research and advance the understanding of autism. By building a community of tens of thousands of individuals with autism and their biological family members who provide behavioral and genetic data, SPARK will be the largest autism research study to date.

- Eligibility: Diagnosis of ASD
- Time required: Complete a few questionnaires, provide a saliva DNA sample using collection kits sent directly to your home
- Location: Online surveys
- Monetary compensation: gift card up to \$50

Biomarker Study

The goals of this study are to: 1. Gather additional information on subpopulations of autism spectrum disorder as identified by the Sponsor and 2. Learn more about autism spectrum disorder by identifying subgroups of patients with autism based on biomarkers. Biomarkers are also known as "biological signs" that can be linked to a condition and how it progresses.

- Eligibility: Age 12-45 with a diagnosis of autism spectrum disorder AND participation of a care/study partner, such as a parent or spouse
- Time required: One visit lasting approximately 3 hours
- Location: Thompson Center
- Monetary compensation: \$100 per completed visit, meal voucher, and travel compensation

RI-CART Adolescent & Young Adult Study (RAYS)

Thompson Center and Brown University researchers are conducting a study examining the challenges and problems that adolescent and young adults experience over the course of adolescence and young adulthood.

- Eligibility: Age 12-24 with ASD and parent/guardian
- Time required: 4 study visits one year apart for 3 years
- Location: Online surveys and interviews
- Monetary Compensation: up to \$395 for youth/young adult and up to \$225 for parent/guardian

Interested in these studies or others?

Call the Research Core at 573-303-8405, email tcresearch@missouri.edu, or scan the QR code to learn more.



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